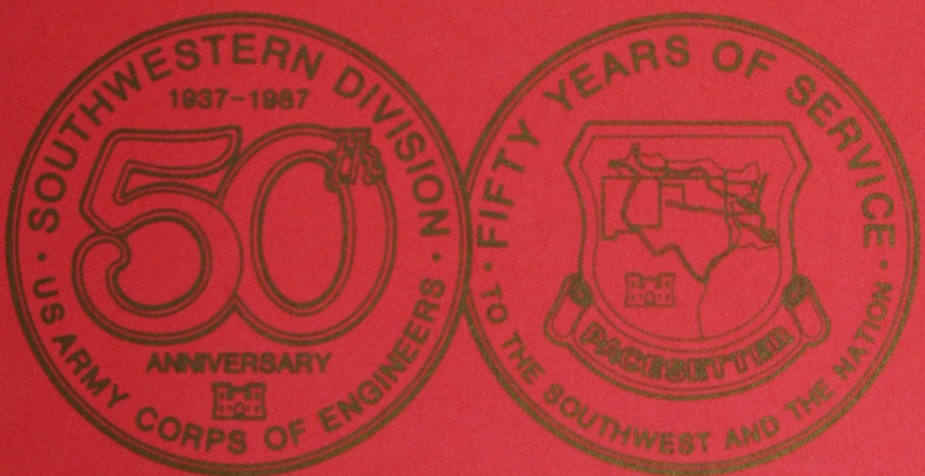
Southwestern Division
U.S. Army Corps of Engineers
July 1, 1937-July 1, 1987

A Condensed History



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July 1, 1937-July 1, 1987

A Condensed History

Compiled from *The Southwestern Division: 50 Years of Service*
by D. Clayton Brown, Ph.D.

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(Produced by the Public Affairs Office)

1
ORIGINS

The creation of the Southwestern Division, United States Army Corps of Engineers, in 1937 represented a significant step in the growth of the federal government's responsibility for flood control in the Southwest.

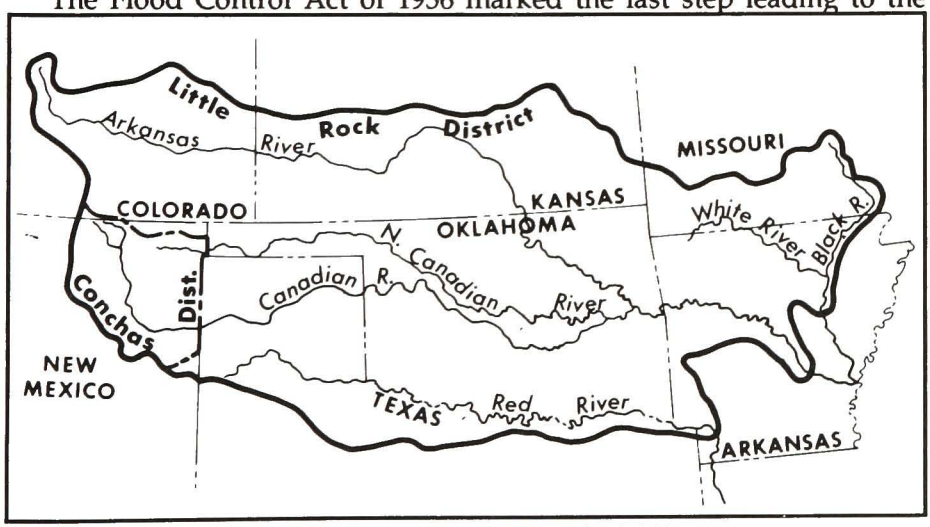
The region included several large river drainage systems—primarily the Arkansas, Trinity, Brazos, Red, White and Rio Grande. They frequently flooded, causing or contributing to some of the worst deluges in modern American history.

By the 1930s the southwestern states were becoming more urbanized and starting to develop an industrial economy. With the growing population in these river basins, there was a natural demand that the flooding be stopped—or at least brought under control.

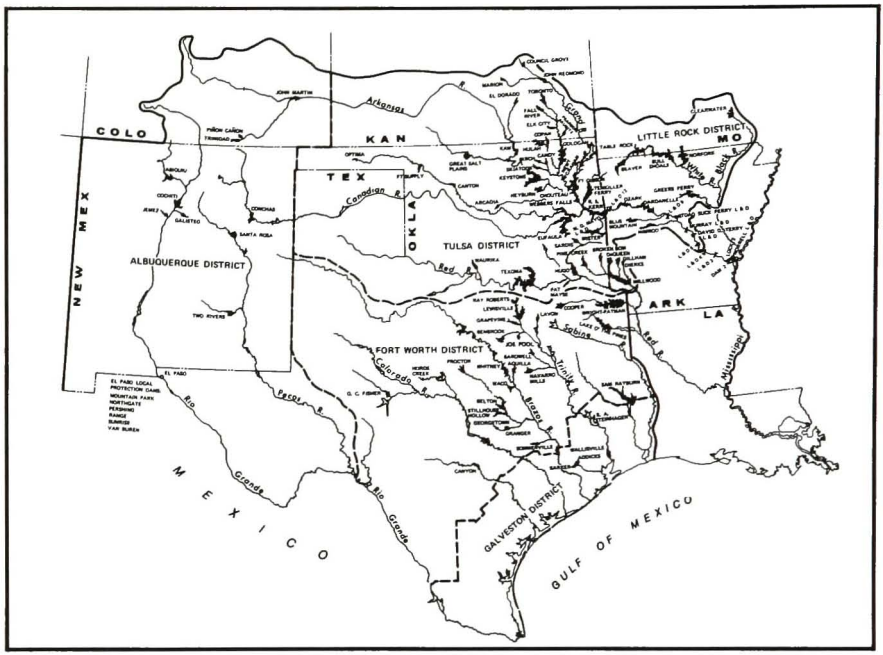
Before the 1930s the roles of the Corps of Engineers in the Southwest had included surveys, dredging and snag-clearing. One major project was improvement of Galveston Harbor on the Texas Gulf Coast.

The disastrous Mississippi River flood of 1927 dramatically illustrated the need for a comprehensive plan of flood control, particularly in the Lower Mississippi Valley. Many authorities agreed that only the federal government had the resources for such a large task. As momentum for federal intervention increased, the Depression struck. The election of President Franklin D. Roosevelt in 1932 marked the beginning of massive federal works throughout the United States, including river improvements.

The Flood Control Act of 1936 marked the last step leading to the



The Southwestern Division, July 1,1937.



Southwestern Division dam projects, existing or under construction, May 1,1987.

creation of the Southwestern Division. It authorized 211 flood-control projects in 31 states at an estimated cost of $300 million. The measure also incorporated the concept of multipurpose planning, meaning that federal river basin development would include hydropower, soil conservation, navigation and water supply.

Southwestern Division established

To oversee projects on the Arkansas, White, Black and North and South Canadian rivers in the Southwest, the Corps of Engineers established the Southwestern Division on July 1, 1937. It initially included the Conchas District, which was constructing the Conchas Dam in eastern New Mexico, and the Little Rock District, which covered parts of Arkansas, Oklahoma, Kansas, Colorado, Missouri and New Mexico.

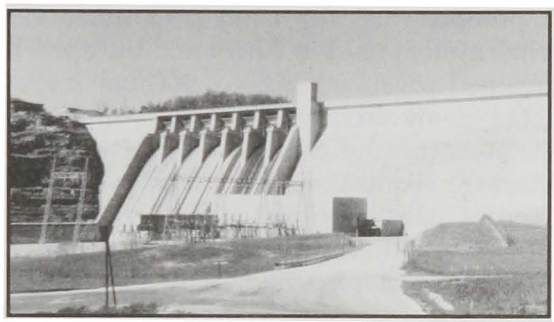
The division began functioning on July 14 in Little Rock, Arkansas. Its first personnel primarily came from the Memphis District, including Col. Eugene Reybold, the first division engineer.

In 1939 the division's workload increased with the creation of two new districts: Denison, which would build Denison Dam on the Texas-Oklahoma state line; and Tulsa, which took over much of the Little Rock District's territory west of Arkansas.

During its first years, the Southwestern Division supervised about

30 examinations and survey reports by its districts in addition to overseeing the projects under construction. Even though the division's responsibilities at this time dealt exclusively with civil works, the small staff had a considerable workload.

The outbreak of war in Europe in 1939 and the growing likelihood of American participation brought an increased number of projects to the Army Corps of Engineers and its Southwestern Division. For example, the Caddoa (formerly Conchas) District built airfields for the Civil Aeronautics Administration. In January 1941 the Galveston District was transferred from the Gulf of Mexico Division to the Southwestern. The new addition included most of Texas and parts of Louisiana, Colorado and New Mexico. To handle the new work, the Division staff grew from about 35 to nearly 100 employees.



Beaver Dam straddles the White River in Arkansas' Ozark Mountains.

Varied geography

With the addition of the Galveston District, the geography and topography of the division ranged from wetlands on its eastern boundary to arid desert in the west. The lowlands of the lower Mississippi Valley contrasted sharply with the high plateaus of the Rocky Mountains.

Some of the richest and poorest people in the United States lived in that expanse, from the classic Ozark backwoodsman to sophisticated urban residents.

Geographic conditions held much significance for the Southwestern Division. The region's broad expanse and clear skies would prove attractive for military installations and defense contractors. The presence of major rivers meant that the division would face the task of making the region safe from flooding. The growing southwestern economy would also let the division benefit from and contribute to the expansionist ideology of the region.

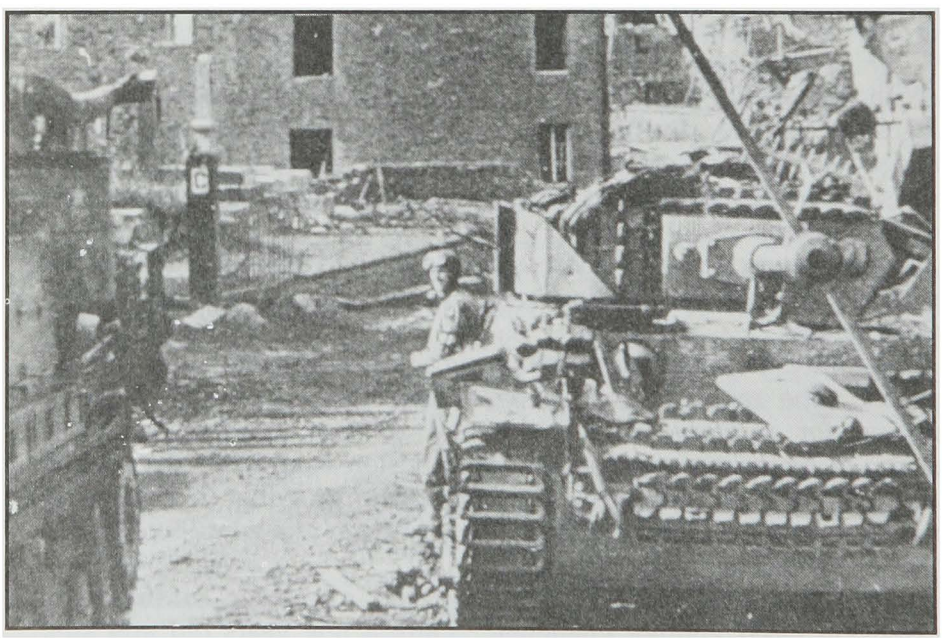
But before it could become deeply involved in reservoir construction, the division faced another challenge. Only a few years old and still trying to consolidate itself, it turned to military construction soon after the Japanese attacked Pearl Harbor on Dec. 7, 1941.

2
WORLD WAR II

In December 1941 Congress transferred responsibility for Army construction from the Quartermaster Corps to the Corps of Engineers. That legislation further increased the Southwestern Division's workload. It began building airfields, depots, hospitals and other military installations. To better manage its responsibilities, the division moved its headquarters in 1941 from Little Rock to Dallas, Texas.

The division also handled special procurement projects for the Army. It awarded $100 million in contracts for small gasoline engines that pumped fuel for tanks and other vehicles through a portable pipeline system used in Africa and Europe. The easily camouflaged and maintained pipeline replaced the fuel trucks that had been a favorite target of enemy aircraft.

Another of the Southwestern Division's wartime tasks was the short-range acquisition of aviation gasoline storage tanks. On the day the order was received, the division sent telegrams to the six manufacturers that could supply the demand, bypassing the normal 30-to-40-day negotiation period.



Some American tanks in Europe were refueled via pipelines partially procured through Southwestern Division efforts.

The division's familiarity with oil field supply companies earned it the responsibility for purchasing the material and equipment used to make "Hessian mats," a temporary airfield paving material.

The Southwestern Division played a small, but important, role in the development of the atomic bomb. Its Real Estate Division acquired 54,000 acres of land for offices and laboratories at Los Alamos, New Mexico.

Harbor defenses

Through the Galveston District, the Southwestern Division had a direct role in the defense of the United States with the installation of coastline batteries at Texas harbors. These defenses were intended to protect shipping from air attacks and to fend off enemy submarines, which had been active in the Gulf of Mexico.

The division managed construction of defense plants throughout its region. Among the facilities were the Oklahoma Ordnance Works; bomber modification plants at Tulsa and Oklahoma City, Oklahoma; and a bomber plant at Fort Worth, Texas. Work on civil projects nationwide either stopped or crept along at a snail's pace during the war. Two exceptions within the Southwestern Division were the Denison and Norfork dams. Construction continued on them partly because of the potential to use their hydropower in defense plants. The division also constructed Barker Dam, an important flood-control project in Houston, during the hostilities.

When World War II ended, the Southwestern Division was one of the largest in the Corps of Engineers. It had handled about one-fifth of the Corps' total construction expenditures, about $2 billion. The division's civil functions had taken only a temporary back seat, because a 1943 flood on the Arkansas River acted as a reminder that the Corps' task of harnessing rivers was still unfinished.

3
CIVIL WORKS, 1945-1986

Reservoir construction has played a major part in federal public works in the Southwest since World War II. By 1987 the Southwestern Division and its districts had designed and built dozens of reservoirs; water improvement projects such as bank stabilizations and channel modifications; and maintenance projects such as harbor dredging. Civil works responsibilities during these years expanded to include operation and maintenance of recreational facilities at its projects; regulatory permits; flood plain management; emergency disaster relief following hurricanes and tornadoes; and many special water development studies.

Before the war ended, Congress planned to prevent a post-war depression by authorizing civil works projects, including reservoirs. Between 1944 and 1950 the legislators authorized 23 reservoirs within the Southwestern Division. The increased work led to the creation in 1950 of the Fort Worth District. It took on civil works responsibilities for most of Texas, except for the panhandle and the Gulf coast. The Galveston District handled coastal projects and military construction.

Establishment of AWRBIAC

From 1950 to 1955 the division participated in a special study of the Arkansas, White and Red river basins. This study was conducted by the first of two committees bearing the name Arkansas-White-Red Basins Interagency Committee, better known as AWRBIAC. The division's part in the study would result in a broadening of its activities in civil works. Also ordered to participate were the departments of Labor, Commerce and Interior, the Federal Power Commission and the Public Health Service. Governors of eight states were also invited to take part. President Harry S Truman designated the Department of the Army to be the chair agency for the committee. The Southwestern Division received operational responsibility for the task.

The first AWRBIAC's course was occasionally rocky, as the multitude of agencies strove for meaningful results in spite of differing missions and interests. Perhaps the most publicized disagreement was one between the Corps of Engineers and the Soil Conservation Service. The two differed on basic philosophy regarding the size and kind of dams that would best prevent flooding. But the Corps pointed out that each agency's method was meant ideally to complement the other's.

The internal friction delayed the AWRBIAC's report and led in September 1953 to a redefining of its objectives. The final document, completed in 1955, was intended as a framework for Congress to use in

any development of the three river basins. It was not to serve as a basis for authorization of any project.

Division's role in AWRBIAC

The Southwestern Division's role in AWRBIAC had been administrative. Through the AWRBIAC office in Tulsa, Oklahoma, the division coordinated committee meetings and public hearings and handled budgeting. Its experience with AWRBIAC was important in several respects: committee duties became a major task for the Division as chair agency during the five-year study period; the AWRBIAC's data probably resulted in a better report than had previously been prepared on any river basin; the division also weathered the publicity storm over the Corps' differences with the Soil Conservation Service.

But probably most significant was the effect AWRBIAC had in opening the door for similar studies. In 1954, even before the final report was finished, AWRBIAC's parent agency, the Federal Interagency River Basins Committee, created a new AWRBIAC.

The second AWRBIAC's organization was designed to avoid the problems of the first. It started slowly, did not engender publicity, and its work at first did not lead to anything outstanding. Its greatest accomplishment was the friendly, cooperative atmosphere it maintained among its members. Such an atmosphere encouraged the exchange of information among those federal and state agencies with an interest in the three river basins. The Southwestern Division continues its activities in AWRBIAC to this day.

A duststorm roils through Oklahoma in the 1930s. (U.S. Conservation Service photo)

President Dwight D. Eisenhower's inauguration in 1953 ushered in an era of fiscal conservatism. But severe drought in Texas and Arkansas during the early 1950s nevertheless persuaded Congress to authorize several new reservoirs in those states.

Typically, the drought ended with a historic flood in the spring of 1957. The rains filled the new Garza-Little Elm (now Lewisville) Lake in just seven days. The new structure prevented catastrophic flooding in the Trinity watershed, but considerable damage still occurred. Had it and other lakes on the upper Trinity not been available, the division engineer said, floodwaters would have reached downtown Dallas.

In April 1942 Trinity River floodwaters put this service station, at South Haskell and Parkdale Drive in Dallas, out of business.

Federal reservoirs on the Brazos River in Texas had the same beneficial effect, preventing devastation in Waco, Texas.

In 1958 the Southwestern Division became active in the U.S. Study Commission-Texas, a body that was to make a full-scale survey of water in Texas. It was to look at promotion of conservation, use and development and to formulate a comprehensive development plan for consideration by the President and Congress.

The commission operated quite well, in spite of the basic conflict between water interests in the dry western parts of Texas and east Texas, with its relatively abundant water resources.

Overall, water development measures during the Eisenhower administration were sparse. Election of John F. Kennedy in 1960 brought a new White House attitude toward water projects. Between 1960 and 1965, 25 new reservoirs were approved. The division's Galveston District kept busy with deep-draft channelization maintenance projects along the Gulf coast. These projects enabled ocean-going ships to reach ports through waterways such as the Houston Ship Channel, the best known deep-draft channel in the Southwest.

Lake recreation

Where lakes full of clean water come into being, boaters, fishers, swimmers and lake-shore residents are sure to follow. Thus,

construction of so many reservoirs in the Southwest brought a new dimension to the operation and maintenance of the division's projects: recreation.

Throughout the United States the public increasingly used Corps reservoirs for boating, fishing, picnicking and other leisure-time activities. In the Flood Control Act of 1944 Congress recognized the recreational potential of reservoir projects and the responsibility of the federal government to make these resources available for public use. The act granted general authority to the Corps to construct recreational facilities at its reservoirs. Those facilities included boat launching ramps, access roads, picnic tables and cooking grills, rest rooms, parking areas, water supply and swimming areas and boat anchorage areas.

But because the Corps still regarded flood control as its major objective, it placed a low priority on recreation during this time. So its development of these facilities was slow. Public use of reservoirs, however, grew rapidly. In 1946 the division recorded 673,000 visitors to its projects. By 1952 the figure had climbed to 11 million. In 1981 a record-breaking 145 million people visited division lakes.

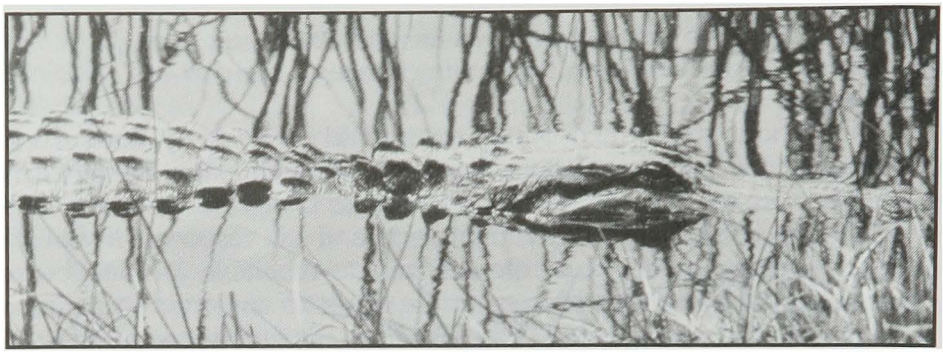
By 1954 the public began to complain about the inadequate recreational facilities at the projects. This reaction and suggestions by the Corps brought congressional action in 1962 allowing project budgets to include allocations for outdoor recreation. Soon after, Southwestern Division engineers were conducting seminars on recreational development and including it in project plans.

In 1970 the Chief of Engineers established recreation branches at division and district level to handle the workload. The next year the Southwestern Division started a ranger-training program to teach personnel to assist the public. These rangers learned fish and wildlife management, recreation administration and conservation. They could not carry weapons, but they were authorized to issue citations for violations of the rules and regulations governing the lands and waters administered by the Corps.

Lakeshore Management Program

Closely allied to the Corps' recreation activity was its Lakeshore Management Program. One outgrowth of the increased recreational use of reservoirs was increased demand by adjacent landowners for exclusive use of facilities such as boat docks and other floating structures.

When the reservoirs had first been built, there had been more than enough land, water and shoreline to accommodate requests for private use. But mushrooming growth around many lakes created problems with pollution and other environmental impacts; encroachment on public land; law enforcement; and the need for adequate public



An alligator looks for prey in a protected wetland on a Southwestern Division project.

facilities. The situation forced the Army Corps of Engineers to develop a program for managing its shorelines. The Southwestern Division formulated guidance for its five districts, weighing provisions for public access, environmental protection, prevention of encroachment and protection of landowners' rights.

After most of the lakeshore management plans were completed, it became evident that the division needed a policy that provided for review and revision. As development around the lakes continued to increase, public pressure again grew for areas to be re-zoned to allow for construction of private boat docks and other floating structures. To handle the requests, the division developed a policy of regular review and updating of the plans.

Development of non-federal hydropower

One of the Southwestern Division's major responsibilities over the years had been the construction and operation of hydropower plants at many of its water projects. In the 1970s, as a result of the energy shortages, a new twist appeared: construction of hydropower plants at Corps dams by a non-federal sponsor. President Ronald Reagan's mandate to promote privatization carried this development forward into the 1980s.

By 1986 the Federal Energy Regulatory Commission had issued 28 permits or licenses for non-federal hydropower plants within the Southwestern Division's area. Two projects were under construction on the McClellan-Kerr Waterway in Little Rock District in 1986; design was under way on projects in other districts. The sponsors use the Corps' design and construction criteria for their projects. The Corps must review and approve designs, plans and specifications and inspect construction at the licensee's expense.

A similar but independent project occurred at the Town Bluff Dam at B. A. Steinhagen Lake near Jasper, Texas, in the Fort Worth District. The financing arrangements for this project were unique. The Corps will build and own the unit, but the Sam Rayburn Municipal Power Agency is to pay for installation of the hydropower facility. In return, it is guaranteed use of the energy for 50 years.

Summary

As the Southwestern Division approached its 50th anniversary, its work on the traditional dam and reservoir projects was drawing to a close, and no new ones were anticipated. Even the Corps' practice of building hydropower plants in its own dams was changing.

In contrast, the large number of visitors to the many existing reservoirs and anticipated visitation at those under construction had made recreational maintenance and operation a major task. This development occurred throughout the United States, but the division's significantly large percentage of the total Corps visitation level gave it one of the larger recreational and lakeshore management programs in the Corps.

4
NON-STRUCTURAL CIVIL WORKS

Although dams and dredges come quickly to mind at the mention of the Army Corps of Engineers, water-related projects make up just part of the Corps' civil works mission. The very definition of civil works—and the duties of Army engineers—expanded greatly during the Southwestern Division's first 50 years. Few things demonstrate the division's changing role better than the growth of the regulatory program.

Regulatory Program

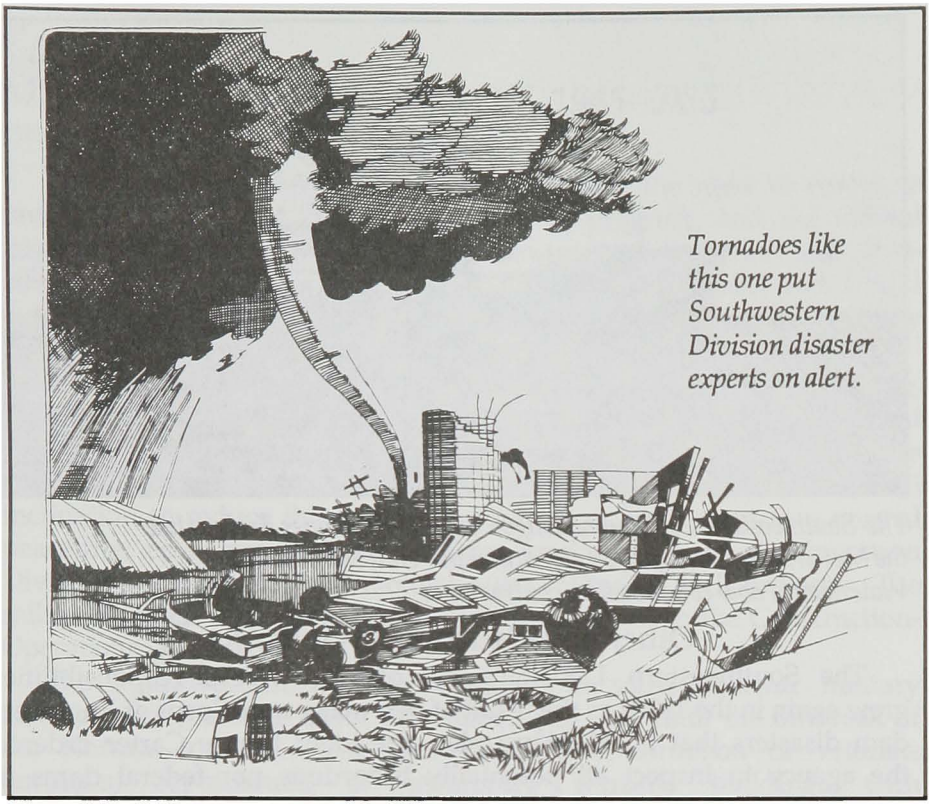
The Army Corps of Engineers began regulating the nation's waters in the 1890s with the primary purpose of protecting navigation. Through a series of laws and court decisions over the years, the regulatory program gradually broadened to include factors affecting protection and use of water resources.

The regulatory program established by all this legislation has been and continues to be one of the more visible and controversial of the Corps' responsibilities. Activities affecting the nation's waters and wetlands proposed by state and local governments and the private sector require the same in-depth environmental review given to federally sponsored projects. Examples of such controversial projects within the division include the Baker's Port Marine Terminal near Corpus Christi, Texas; Las Colinas Floodplain Reclamation near Dallas; Limestone, Choke Canyon, Richland Creek, Applewhite and Stacy reservoirs, all in Texas; the Corpus Christi landmass project; various Metroplex Trinity River floodplain reclamation projects; and the issues surrounding regulation of bottomland hardwood wetlands.

Permit decisions require public hearings that give persons on both sides the chance to have their say. The evaluation process must also comply with a host of other environmental laws and regulations. This growth has increased the role of the division engineer in the regulatory program by transferring to that level the authority formerly reserved for the Chief of Engineers and by creating new program requirements.

Flood Plain Management

The division's Flood Plain Management Services Program provides another example of its varied civil works responsibilities. This program provides free advice and technical data upon request to both public and private parties about flooding or its probability in known flood-plain areas. In return, requesters are encouraged to furnish



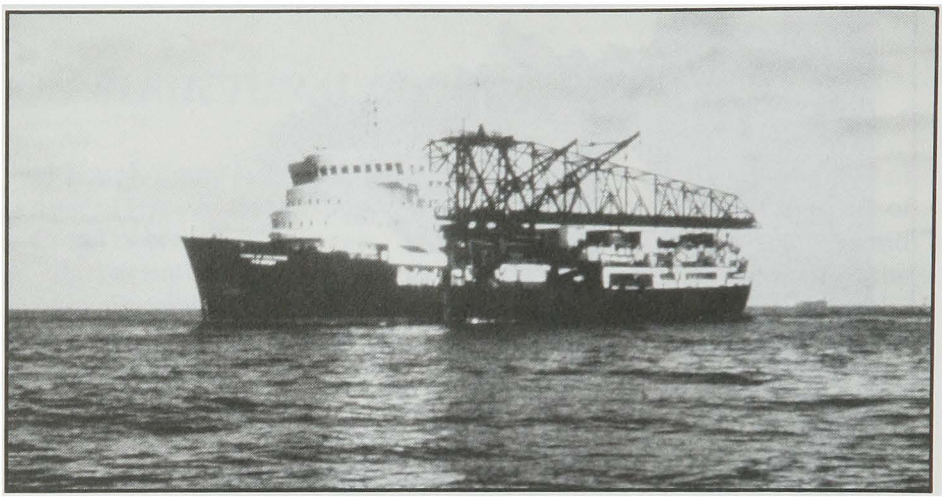
Tornadoes like this one put Southwestern Division disaster experts on alert.

information such as field survey data maps, historical flood information and similar material. Most of the Corps' flood-plain work deals with areas in the path of urban growth and development, with most requests in the division coming from the metropolitan areas of Little Rock, Tulsa, Fort Worth and Dallas.

Disaster relief

Because of the disastrous nature of floods, the Army Corps of Engineers' civil works responsibilities since World War II have expanded to include disaster relief. As natural disasters occurred in the United States, it became obvious that federal aid aimed at debris removal, structural rebuilding and damage surveys was needed.

The Southwestern Division and its districts have assisted the public in recovering from a variety of disasters since 1937. The Galveston District assessed property damage in the wake of Hurricane Carla in 1961. The Fort Worth District in 1970 organized debris-removal crews after a tornado in Lubbock, Texas. The division, through its Emergency Management Branch, primarily furnishes supervisory oversight to the districts after disasters.



The Southwestern Division no longer owns and operates dredges like the McFarland. Dredging on rivers and the Gulf Intracoastal Waterway is now conducted by contractors.

Other non-structural civil works

The Southwestern Division's list of civil works responsibilities grew again in the 1970s as the result of two major non-Corps of Engineers dam disasters that killed 46 people. President Jimmy Carter ordered the agency to inspect all potentially hazardous non-federal dams in the country. The division's share totaled 1,104 structures, of which 374 were found unsafe. In some states in the region, the division coordinated with state agencies, which made the actual inspections.

Another civil works task for the division came after an agreement in 1978 between it and the Environmental Protection Agency. The EPA "hired" the division to inspect municipal waste-water plants for compliance with construction standards. Some 50 division and district personnel began spending part of their time visiting 255 sites in Texas, Oklahoma, Arkansas and New Mexico.

By 1986 the greater variety of responsibilities thrust upon the Corps had to an extent offset the decline of dam and reservoir construction in the Southwestern Division. Non-structural projects had grown in number, and the division had moved into the area of flood-plain zoning, a contrast to its traditional role of structural flood control. Other examples of non-structural civil works such as the Regulatory Program, dam safety inspections and hurricane studies held out the promise that the division's role would continue to change.

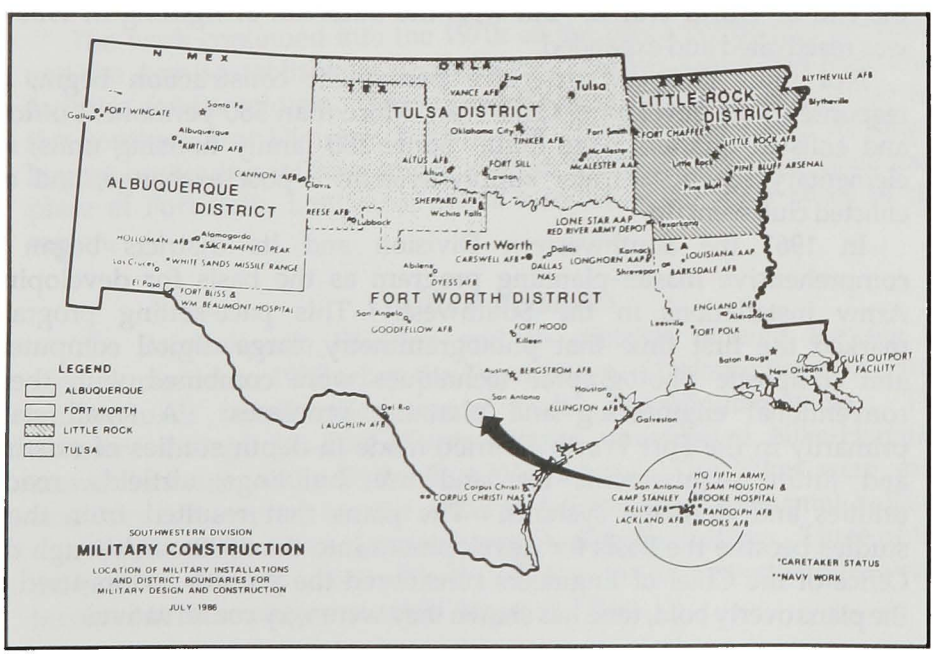
Gone were the days of constructing large-scale dams and reservoirs. In view of the federal government's continuing strong emphasis on cost reduction, the Corps' non-structural projects could eventually become the dominant side of its civil works mission.

5
MILITARY CONSTRUCTION, 1945-1986

The conclusion of World War II eliminated the need to complete much of the military construction then in progress, and the federal government decided to conclude the work as quickly and cost-effectively as possible. Projects that were nearly finished and would eventually serve a useful purpose were completed. Most military projects, however, stopped.

As Army and Air Force decided which bases would remain active, the Corps of Engineers became involved with the disposal and dismantling required. This process, which occurred in the Southwest as well as the rest of the United States, resulted from a natural inclination to reduce the nation's armed forces and return to a normal peacetime economy. As the military workload of the Southwestern Division declined, some personnel were shifted to civil projects. The military branch of the Engineering Division moved to the Construction-Operations Division.

The Southwestern Division engaged in some postwar military construction, reaching about $25 million per year until the outbreak of the Korean conflict. The jobs included construction of veterans hospitals, replacement of temporary wartime buildings with permanent structures and expansion at Carswell Air Force Base, Texas,



for the B-36 bomber. The division's military construction, however, was much smaller than its civil works mission. On the eve of the Korean conflict, the Tulsa District, for example, had a $17 million civil works program compared with $1 million in military projects.

Things changed rapidly with the outbreak of hostilities in Korea. By war's end the Tulsa District had placed $150 million under contract. The Galveston District renovated air bases at Victoria, Harlingen, Ellington, Laredo and Laughlin, Texas, and Lake Charles, Louisiana.

As in World War II, speed and unusual demands often came the division's way. Early in the Korean conflict the Chrysler Corporation received a contract to manufacture tank cylinder heads at the Michoud Ordnance Plant in New Orleans, Louisiana. Among the division's renovation tasks was the complete dismantling and relocation of a foundry from Chicago to the plant. The division also designed, procured and installed several hundred tons of humidity-control equipment for the 47-acre structure. The pilot production line went into operation, but because of changing requirements, the plant never went into full production.

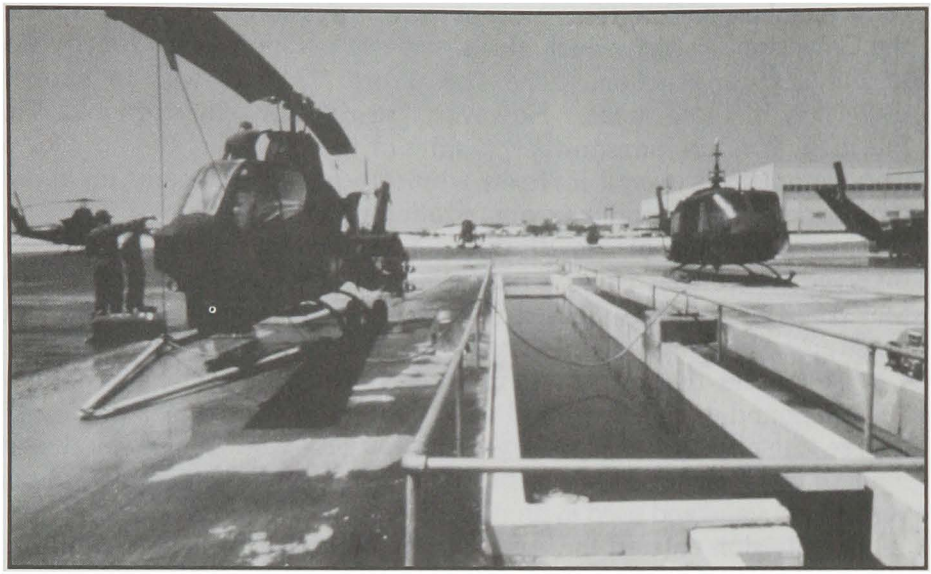
Fort Hood, Texas

Exemplifying the Korean build-up and subsequent military preparedness was Fort Hood, Texas, at the time the largest single military installation in the country and one of the division's most important projects. Like most installations in the division, this 340-square-mile area of rolling hills and plains had reduced its activity at the end of World War II. But with the outbreak of fighting in 1950 it was reactivated and expanded.

Not until 1953 did extensive permanent construction begin, in response to the developing Cold War. More than 380 permanent officer and enlisted quarters were built. Some 200 family housing units; an elementary school; a water supply system; a post exchange; and an enlisted club went up.

In 1961 the Southwestern Division and its districts began a comprehensive master-planning program as the basis for developing Army installations in the Southwest. This pace-setting program marked the first time that photogrammetry, large digital computers and composite photographic techniques were combined with then-conventional engineering and planning processes. A small staff, primarily in the Fort Worth District, made in-depth studies of existing and future requirements for land use, buildings, airfields, roads, utilities and drainage systems. The plans that resulted from these studies became the basis for development into the 1980s. Although the Office of the Chief of Engineers considered the growth factors used in the plans overly bold, time has shown they were very conservative.

At Fort Hood, the master plan called for 1,000 housing units, a theater, library, field house, barracks and officers quarters, a dental clinic and tactical equipment shops. Construction started in 1961. In 1963 ground-breaking ceremonies were held for the installation's Darnall Army Hospital.



The Southwestern Division's recent military construction projects include this helicopter wash rack at Fort Hood.

The work continued into the 1970s as the post's population increased and the Army established a policy of modernizing living and recreation facilities for its soldiers. These projects have not been spectacular for the Southwestern Division, but they have made Fort Hood its single largest continuing military effort. Similar work on a smaller scale took place at Fort Polk, Louisiana, and a number of air force bases in the region.

Guided missiles

The Southwestern Division and its districts entered the era of guided missiles in 1957 when the Department of Defense began erecting surface-to-air missile sites around major metropolitan areas. The division, through its Fort Worth District, constructed Nike-Hercules launch facilities in the Dallas-Fort Worth area. The Nikes were soon abandoned, however, for the Atlas and Titan intercontinental ballistic missiles, larger and more complex missile defense systems. Three of the division's districts—Fort Worth, Tulsa and Albuquerque—were involved in these programs, which began in 1960.

In 1961 the Corps of Engineers realigned its military construction boundaries, restricting the responsibility to 17 districts. The Southwestern Division's Galveston, Tulsa and Little Rock districts lost their military missions, with the Fort Worth District taking over much of the load. The change produced some concern among the public and some members of Congress. Most of the congressional queries dealt with the Galveston District, which also lost some personnel not directly tied to military construction. The Fort Worth District was to support Galveston in those areas. However, the division engineer told Vice President Lyndon Johnson that in spite of the cutbacks, the number of Corps employees overall in Texas would increase because of the heavy civil works schedule, and the reorganization stood.

One large part of the division's involvement in missile projects involved its work at what is now White Sands Missile Range in New Mexico. The division handled real estate acquisitions and design and construction of many buildings and testing facilities.

One of the first major technical facilities at White Sands was a 100,000-pound engine test stand. It was built on a granite slope at a 45-degree angle. At the time it was the largest engine test stand ever built. It was never used for its intended purpose, but was connected to a vertical test stand and used in production tests for the Redstone engine.

The division entered the space age at White Sands in 1965, building several research facilities for the National Aeronautics and Space Administration. Highly technical and complex projects like these contrasted sharply with the division's more routine military construction of barracks and airfields.

Like the Korean conflict, the war in Vietnam initially brought a surge of military construction to the division. Its districts handled work at Fort Wolters and Fort Sam Houston, Texas; Fort Polk, Louisiana; and Fort Sill, Oklahoma.

But the net effect of the Vietnam War was a reduction in funding for military construction. Projects were deferred or canceled and the funds diverted to direct support of the war in Asia.

This move affected personnel in the Albuquerque District, which lost funding and responsibility for military construction to the Fort Worth District. By 1971 Albuquerque had lost 226 positions, and Fort Worth handled all military construction in the division.

Post-Vietnam era

The switch to an all-volunteer Army in 1972 meant that the armed forces would have to provide more comfortable and attractive living quarters for their personnel. The Southwestern Division and Fort Worth District designed and constructed new barracks at several bases. They designed a module plan that gave each soldier 90 square feet of

living space, exclusive of bath, toilet and storage. New buildings were three stories high with quarters for 24 persons on each floor. Each building had a service area with laundry facilities, mail service and vending machines. Each barracks complex included dining facilities, gymnasium, chapel and headquarters and supply building.

Enlisted-personnel barracks at Holloman Air Force Base, New Mexico, got a facelift and interior renovation through division efforts.

Military construction in the late 1970s reflected the policies of President Carter's administration. Programs were heavily flavored with energy and environmental projects. For example, the division used solar energy to cool as well as heat reserve centers at Albuquerque, New Mexico; Seagoville, Texas; and Greenville, Mississippi.

The emphasis on environmental projects, particularly cleanup of hazardous waste sites, has continued to affect Army operations well into the 1980s. Environmental experts began finding hazardous waste dumps—some of them now leaking—on military installations as well as on private lands. Many of these sites dated back to World War II, when they had not been considered dangerous. The Southwestern Division is still working with the Pine Bluff Arsenal in Arkansas to clean up stores of the insecticide DDT. It had been produced as an unwanted by-product in the production of nerve gas.

The inauguration of President Reagan brought a boost to the Southwestern Division's military construction budget. When Congress renewed the B-1B bomber program, which President Carter had

shelved, the division jumped into design and construction of $90 million in facilities for the aircraft at Dyess Air Force Base. It did similar work to support the C-5A cargo aircraft at Kelly Air Force Base, Texas.

Building 3001

Speed has often been a critical factor in Southwestern Division military projects, as illustrated by the reconstruction of the roof of the 54-acre Building 3001 at Tinker Air Force Base near Oklahoma City, Oklahoma. The structure houses a major center for depot-level maintenance on Air Force aircraft and jet engines.

In November 1984 a fire destroyed 17 acres of the giant building's roof. About 2,000 tons of structural steel and roof decking were ruined, along with utility lines and 12 major aircraft engine repair stations. Two days after the fire started, the Air Force asked the Army Corps of Engineers for help in rebuilding the facility. The division, working through its Tulsa District (which had regained military construction responsibilities in 1981), coordinated the $63.5-million repair job.

The Air Force's target date for completion was September 1985—only 10 months away. The tight schedule forced a number of changes in the way engineers would normally handle such a rebuilding job. Another decision caused by the short timetable was to begin construction in early March, before the design work was done—even before the scope of the work was completely known. Such an action had risks. A design that was rushed to completion before construction began could result in changes down the line that would cost both time and money. But the decision paid off. Construction was completed in August 1985, except for some items added to the contract by change orders.

Hospital construction

Hospital construction has played another major part in military projects for the Southwestern Division and its districts since the late 1970s. In 1978 the Fort Worth District began the expansion of Wilford Hall Medical Center at Lackland Air Force Base, Texas. Plans called for an increase of floor space from 480,722 to more than 1.2 million square feet. It would be the largest Air Force hospital once it was finished. The project included construction of a south wing containing a nine-story hospital tower and a three-story clinic. A one-story north wing would house a helicopter pad, food service facilities and physical therapy units.

Other hospital projects within the division were at Carswell Air Force Base, Fort Hood, Fort Polk and Fort Bliss.

Other projects

In 1980 the Fort Worth District began awarding contracts, which by 1986 amounted to $40 million, to build a High Energy Laser System Test Facility. Located on the White Sands Missile Range, it was designed to provide both Army and Navy with a complete facility to test the powerful lasers and their effects on various materials. This project served as a basis for President Reagan's Strategic Defense Initiative, known as the "Star Wars" program.

In May 1982 the Army signed an interagency agreement with the Department of Energy, and the Albuquerque District began construction of the Waste Isolation Pilot Plant in deep salt caverns near Carlsbad, New Mexico. It was to be the first permanent repository in the world for storage of the by-products of the nuclear defense industry.

In 1984 the division received a new assignment in the area of military construction, the Defense Environmental Restoration Program. The Corps had responsibility for determining and correcting problems with hazardous materials found on former Department of Defense sites. The materials fell into three categories: debris, ordnance and toxic waste.

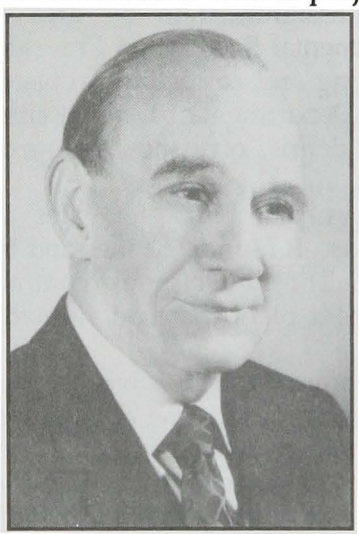
The Southwestern Division received responsibility for sites in Texas, New Mexico, Oklahoma and Arkansas. It found 720 sites and by 1986 had inspected and reported on 93. The first cleanup contract involved removal of an old sewage treatment plant that had formerly been part of Fort Hood.

By 1986 military construction in the Southwestern Division was large and varied, ranging from mundane projects to some of the most exotic in the United States. The large military workload had offset the decline in civil works construction. By 1986 each district again did some military work. Little Rock became a full military district in 1985, and Albuquerque took on responsibility for installations in New Mexico shortly after. The Fort Worth District brokers some of its military work to the Galveston District so that its engineers can obtain mobilization readiness training.

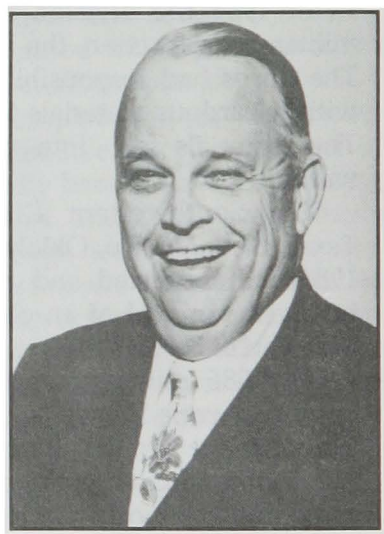
Military projects will certainly remain an important part of the division's work because of the advantages of the Southwest for defense installations. Such projects will also probably serve to keep all the districts active.

6
THE McCLELLAN-KERR WATERWAY

When it was finished in 1971, the McClellan Kerr-Arkansas River Navigation System was the largest civil project ever built by the Army Corps of Engineers. From its beginning on the Mississippi River, the system runs for 448 miles to Catoosa, Oklahoma. It has 17 locks and dams with a total lift of 420 feet. Several large reservoirs were built on the Arkansas River and its tributaries as part of the navigation project. Some of the dams generate hydroelectric power; total generating capacity of the system is 394 megawatts. The waterway cost $1.2 billion when it opened, the largest amount spent up to that time by the United States on a water project.



Senator John L. McClellan



Senator Robert S. Kerr

Riverboats had plied the Arkansas since 1820. But shallow water prevented their regular use beyond Little Rock. Snags also claimed many vessels, in spite of irregular clearance by the Corps of Engineers.

Businessmen in both Arkansas and Oklahoma soon began lobbying Congress for a project to make the whole river navigable. Clarence Byrnes, a newspaper editor from Fort Smith, Arkansas, and Newton "Newt" Graham, a Tulsa, Oklahoma, businessman, led the fight during their lifetimes.

In response to the 1927 flood in the Mississippi Valley, Congress ordered another survey of the Arkansas River basin. A bill introduced in 1929 would have appropriated $20 million for improving the Arkansas up to Tulsa, including navigation features, but it did not pass.

House Document 308

In July 1935 the Corps transmitted to Congress its comprehensive, three-volume study of the Arkansas river and its tributaries, commonly known as the Arkansas 308 report. It concluded that a navigation channel as far north as Tulsa was feasible but not economically justifiable, although some flood-control features had merit.

That report did not stop the proponents of navigation. Newt Graham, for example, charged that in estimating benefits and costs, the Corps had discriminated against the Arkansas when compared with similar studies of the Tennessee and Missouri rivers.

Congress did move ahead in the fight against floods. The flood control acts of 1936 and 1938 authorized 12 flood-control reservoirs on the Arkansas, along with some levee and bank control works. Navigation facilities for the river, however, were not included in either package.

Thus when the division was established in 1937, the Arkansas waterway was still for the most part a dream of business interests in Arkansas and Oklahoma.

In 1939 the division engineer established the Arkansas River Survey Board to conduct another study of the river, which it forwarded to the Board of Engineers for Rivers and Harbors in 1945. After some wrangling over the potential benefits of navigation and other factors, the Chief of Engineers sent to Congress a proposal incorporating navigation, hydropower, flood control and recreation. The waterway would require 27 locks and dams and have 13 reservoirs. Congress and President Harry S Truman approved this plan in 1946.

An uphill struggle

Despite its 1946 authorization, the waterway still faced an uphill struggle. In 1951 Congress ordered an analysis of federal water project policies and procedures. The Public Works Committee then ordered the Corps to review its civil works projects and recommend which should be put into each of three categories—active, inactive and "deferred for further study."

The Arkansas River project went into the third category. For political sponsors of the project like Arkansas Senator John L. McClellan and Oklahoma Senator Robert S. Kerr, this 1954 decision was a real setback.

The Southwestern Division and Tulsa District began immediately to re-examine the navigation project. In 1955 the Chief of Engineers advised the Public Works Committee and the Bureau of the Budget that the Arkansas waterway should be reactivated. The next year $3

million was allocated for Oologah Lake, already under construction. But the Corps wanted to delay additional work until major engineering problems were solved.

The problems concerned the 100 million tons of silt that flowed down the Arkansas River each year. A way had to be found to handle this material, or it would quickly create shoals that would endanger or prevent navigation.

Meanwhile, in 1956 Senator Kerr won funds for three of the reservoirs vital to the navigation project in return for throwing his support to the popular Federal Aid Highway Act. That law authorized the interstate highway system.

Full-scale construction of the waterway began in 1957, in spite of some lingering doubts within the Corps about engineering problems. Ironically, the newly appointed Southwestern Division engineer, Brig. Gen. William Whipple Jr., had opposed the project in his previous job as executive of civil works in the Office of the Chief of Engineers. But upon his assignment he determined to see the project through, for two reasons: Congress had directed the Corps to build the waterway, and he felt confident about finding a solution to the sediment problem.

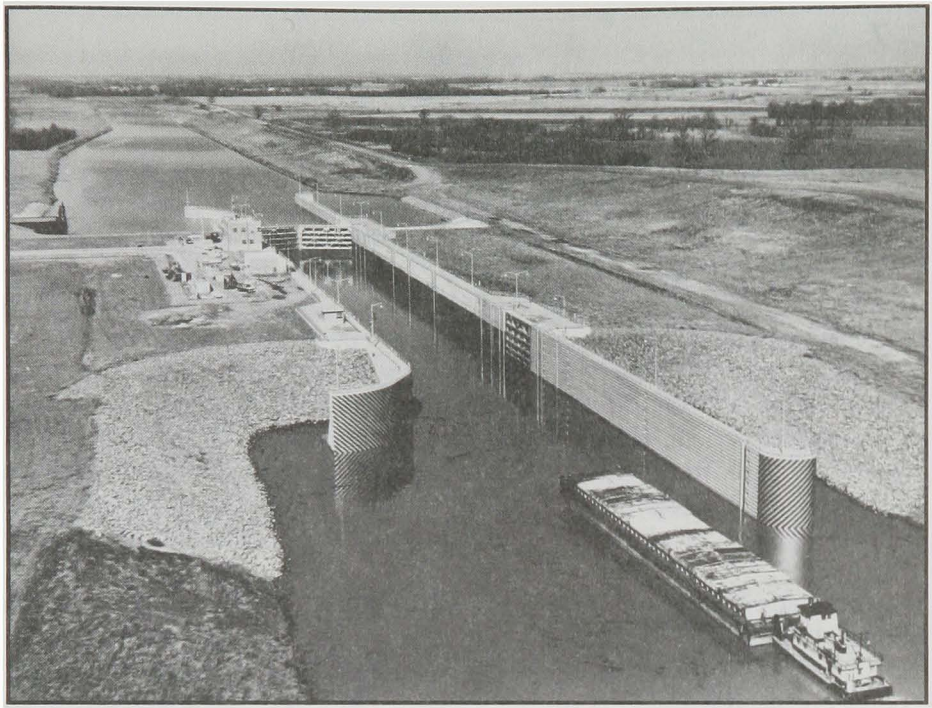
To find a way of dealing with the silt in the Arkansas, Brig. Gen. Whipple organized the Arkansas River Sediment Board. This body came up with a series of proposals that would force the river to cleanse itself of silt, eliminating the need for constant dredging. The Corps' Waterways Experiment Station at Vicksburg, Mississippi, built a model to test the ideas; the plans worked, and detailed design and construction could begin.

In 1960 the next division commander, Maj. Gen. Robert J. Fleming, spoke to the Arkansas Basin Development Association. He told the members that completion of the waterway was now a matter of economics rather than engineering. If funds were approved quickly enough, he said, the project could be finished in 1967 rather than 1973 (Corps officials later settled on 1970 as a scheduled completion date).

Construction progressed smoothly, although President Johnson scared the canal boosters in 1964 when he cut $40 million from the project budget. After some haggling with congressional delegations from Arkansas and Oklahoma, he reinstated the money.

The river is navigable

On Dec. 30, 1970, the waterway was ready for use. The first cargo of freight, 650 tons of newsprint, arrived at the port of Catoosa near Tulsa on Jan. 21, 1971. Born from an idea that began a half-century earlier, the Arkansas River was navigable.



The first commercial towboat to use the Chouteau Lock on the Verdigris River pushes its barges towards the gates in 1971. The McClellan-Kerr system leaves the Arkansas River near Muskogee, Oklahoma, to travel the final 50 miles on the Verdigris to the Port of Catoosa.

In its first year of operation, goods from at least 33 states and several foreign countries traveled the McClellan-Kerr Waterway. By 1977 it was carrying up to nine million tons of cargo a year.

From 1969 through 1975, 374 manufacturing plants moved to or expanded in Arkansas. Most told the division that availability of labor and its lower cost were their first considerations. The waterway was a factor for more than 25 percent of the companies, and lower transportation rates influenced 35 percent to come to the state.

By the late 1970s the McClellan-Kerr Waterway was no longer in the public eye. Barges lazily traveled the stream. Towns and cities along the banks grew, and by 1975 their residents were earning 90 percent of the national average per-capita income. The editor of the *Arkansas Gazette* noted that the "fickle Arkansas, which scourged the countryside with floods and shrank to a trickle in seasons of drought, now runs in bank for the year round....The quality of life has visibly improved."

7
THE TRINITY RIVER WATERWAY

In 1973 voters in 17 Texas counties turned down a tax proposal that would have provided local funding for construction of the Trinity River Waterway, a proposed 360-mile multipurpose navigation project from Fort Worth to the Gulf of Mexico. The controversial election raised locally an issue of national concern: to what extent should the environment be altered for the sake of economic development?

The Trinity River project, although it was never built, had much significance for the Southwestern Division and its Fort Worth and Galveston districts, which had worked on the project for more than 10 years. Aside from the time, the project marked the first time the division had to deal on a large scale with environmentalists and with citizens concerned about the money their local governments would have to invest.

The desire for a navigable Trinity River was far older than the Southwestern Division. Since the first families had settled in the Dallas-Fort Worth area, the river had been seen as a potential link between the north Texas prairie and the Gulf Coast. Steamboat traffic dated to 1836 when the *Scioto Belle* traversed part of the river. A few boats reached Dallas during the 19th century, but the river had two major drawbacks to navigation, noted in two early reports by the Corps. The studies noted that the river was only deep enough for navigation in the spring and that logjams blocked its upper reaches.

Early plans

In 1899 Congress authorized $7,000 for a preliminary survey of the Trinity. The report said that a waterway would require construction of 37 locks and dams at an estimated cost of $4.65 million. Congress appropriated the first funds in 1902. At the peak of construction, 170 men worked on the project, and several locks and dams were partially built.

World War I interrupted construction, which never resumed. One cause was the availability of modern railroad service to Dallas and Fort Worth and the railroads' opposition to what could be a rival source of transportation. In 1921 the Corps made another study of the waterway project and determined that because of the shortage of water, navigation would not be feasible except for the area below Liberty, Texas.

Despite these setbacks, some business interests still hoped to persuade Congress to build the waterway. The state government established a legal agency that would administer activities concerning

Workers labor at partially finished Lock and Dam Number 1 on the Trinity River near Dallas on Oct. 30, 1917. (Reprinted with permission of the Dallas Historical Society)

the project, but voters in a 1935 election refused to give their support.

Passage of the 1936 Flood Control Act, however, once again enhanced the waterway's chances. The legislation incorporated the idea of multipurpose development, broadening the criteria by which water projects could be measured and declared economically possible. The first step came in 1945 when Congress appropriated funds for several reservoirs in the river's upper basin: Benbrook, Grapevine, Garza-Little Elm (now Lewisville) and Lavon.

In 1955 waterway proponents persuaded the Texas legislature to create the Trinity River Authority. This body was to develop a river master plan that included navigation. It had the power to levy a tax, but, remembering the voter opposition in 1935, did not do so.

Congress told the Corps of Engineers to conduct a full-scale study of the Trinity in 1958. Four years later the Corps submitted a recommendation for a $900-million project that would include flood control, water transportation and recreation. The estimated ratio of benefits to cost was 1.6 to 1. In the late 1960s Congress authorized the plan, and the project seemed destined to become a reality.

Public concern grows

But the Trinity project became instead the center of one of Texas' major environmental controversies and the focus of a head-on clash between taxpayers and government.

The controversy came to a climax when the Trinity River Authority announced an election for March 1973 to authorize the $150 million required by law as the local contribution to the project. Proponents centered their campaign on the potential economic development the project would bring to the area. They spoke about the many jobs that would be created. They promoted the recreational benefits that would come with the waterway.

Opponents furnished the public with leaflets containing detailed information about benefit-cost ratios, claims about adverse aspects of barge traffic and concerns about water quality in one of the proposed reservoirs. They also reminded taxpayers of the probable increased tax burdens and mentioned their concern that new reservoirs, ports and other items would be added to the original project, boosting the cost still more.

Another fight involving the waterway centered on a proposed reservoir some 240 miles southeast of the Dallas-Fort Worth area—Wallisville Reservoir, south of Liberty. The Southwestern Division had proposed adding the reservoir to the project to solve a potential problem brought to its attention by a number of rice growers in Chambers County. These people had feared that a nine-foot-deep channel from the Gulf to Liberty would allow salty tidewater to flow up the river and flood their 40,000 acres.

Opposition to Wallisville

Part of the project included a proposed 2,000-acre waterfowl refuge. At a public hearing on the matter, Galveston District officials learned that local residents were strongly opposed to the refuge. The district engineer had some other concerns about the Wallisville project in general, regarding its potential as a water conservation storage lake and the cost to the residents who would be forced to move from the reservoir area. Nevertheless, construction began in 1968.

But in April 1971, when Wallisville was about three-fourths finished, six parties—two fishermen, the Sierra Club, the Audubon Society, the Houston Sportsmen's Club and the Texas Shrimp Association—filed suits against the Corps in hopes of stopping the project. They insisted that completion of the reservoir would destroy breeding and nursery grounds for shrimp, crabs and a fish known as menhaden. The plaintiffs also asserted that the Galveston District had violated the 1969 National Environmental Policy Act by starting

construction before the results of the Corps' environmental study of the project were known.

In February 1973 federal Judge Carl Bue imposed an injunction against further construction at Wallisville. Less than a month later, voters in 17 counties along the Trinity turned out to vote on the waterway issue. For the proposal to carry, it needed an overall majority, and it had to carry in nine of the counties. It lost on both counts. Some 54 percent of the returns were against the proposal. In some Dallas and Fort Worth precincts, voters rejected the measure by more than six to one.

Paddle-wheeled snagboats like this one tried unsuccessfully to make the Trinity River navigable in the 19th century.

The election and Judge Bue's injunction put the proposed Trinity River waterway in a state of limbo, but some portions did go forward. Lakes such as Aubrey (now Ray Roberts) and Lakeview (now Joe Pool) were funded for construction. So were some flood control measures, like the Dallas Extension Floodway and protective levees for the city of Liberty. In 1979 new Corps documents recommended no improvement for the Trinity River itself from river mile 45 to Fort Worth because such work was considered economically unfeasible. Since then, President Reagan's policies on local cost-sharing have made the possibility of a navigable Trinity even more remote.

Proponents of the project can still be found in Texas. They point to the McClellan-Kerr system in Arkansas and Oklahoma as proof that such a waterway could be successful in Texas. Comparison of the two projects is hazardous, however, because conditions like those that existed before and during construction of the McClellan-Kerr are no longer found in the Lone Star State.

The greatest differences between the Trinity and the McClellan-Kerr were the appearance of environmentalism and public concern over cost. The Arkansas River project had been entirely federally funded, but local governments were expected to pay for parts of the Trinity waterway. Protection of the environment had become a popular cause, and its adherents took strong stands against projects like the Trinity. No such attitude had previously existed in the Southwest. That, with the concern over costs, defeated the Trinity River Waterway.

8
TECHNICAL SERVICES

In its capacity as a supervisory agent, the Southwestern Division assigns missions to its five districts and coordinates their execution. It also processes and reviews the work of the districts and exercises the power of approval over district recommendations.

To some extent, however, the division also provides services to its districts. Three examples of these services are the Division Laboratory, the Hydroelectric Power Design Branch and the Economics and Social Analysis Branch. The first two, which belonged to the Engineering Division, emerged during the post-World War II era, while the latter, a part of the Planning Division, did not go into operation until 1965.

Division Laboratory

The division laboratory's origins go back to World War II and the Denison Dam. The Denison District built a small construction-control laboratory downstream from the dam site, a regular procedure at most Corps of Engineer reservoir projects at the time. Most of the work involved soil testing.

In 1947 the Corps chose the Denison lab as one of six to conduct new freeze-thaw tests to evaluate concrete aggregates, a field that had become more important as the number of dam projects grew after the war. A new building at Denison was designated the Southwestern Division Laboratory. By 1948 it had three sections: chemistry, petrography and physical tests.

The 75 miles from Denison to Dallas soon made the cost of operating the lab too expensive because of travel and communications. In 1949 it moved to its present location, a warehouse at 4815 Cass Street, Dallas.

Materials used in dam construction—soils, concrete and riprap (the protective rock coverings of earthen dams)—accounted for the bulk of the laboratory's work until the outbreak of the Korean conflict. That brought an increase of testing involved with military construction, particularly of paving materials for airstrips. The staff also tested paint and building materials such as roofing, caulking compounds, concrete masonry and ceramic tiles.

The defense build-up associated with the Cold War of the 1950s also accounted for the increased testing. Toward the end of the decade construction of missile silos started, and the laboratory tested materials used in that work to ensure they met Corps specifications. This increased workload boosted the staff to almost 70 at one point.

Specialists at the Southwestern Division Laboratory sort and grade industrial diamonds for use in drill bits.

Soil testing still accounted for a large portion of the lab's work. In 1961 lab employees designed and constructed a machine that evaluated a soil's strength and its resistance to sliding on shale layers. The next year the division lab was the first in the Corps to develop apparatus and procedures for back-pressure saturation of samples—forcing water into them, dissolving and compressing air bubbles without changing the sample's volume. Descriptions of the method and apparatus went out to other Corps laboratories.

The lab also conducted research on rocks used for riprap. One important property of these rocks is their ability to withstand repeated cycles of freezing and thawing, a process that produces fractures and splits in the rock.

A unique feature of the division's lab is its program for procuring diamond drilling tools for its own five districts, all other Corps districts in the United States and some other federal agencies. Engineers use the drills to collect samples at the foundation of a dam, airstrip or building. The lab also recovers for re-use diamonds on used drill bits.

To gain full understanding of an underlying foundation, engineers also needed to examine the holes the samples come from. To achieve that, the lab began early on to use the latest advances in photography. In 1959 it purchased a bore-hole camera from Eastman Kodak to photograph the walls of drill holes, some as deep as 5,000 feet. In 1985

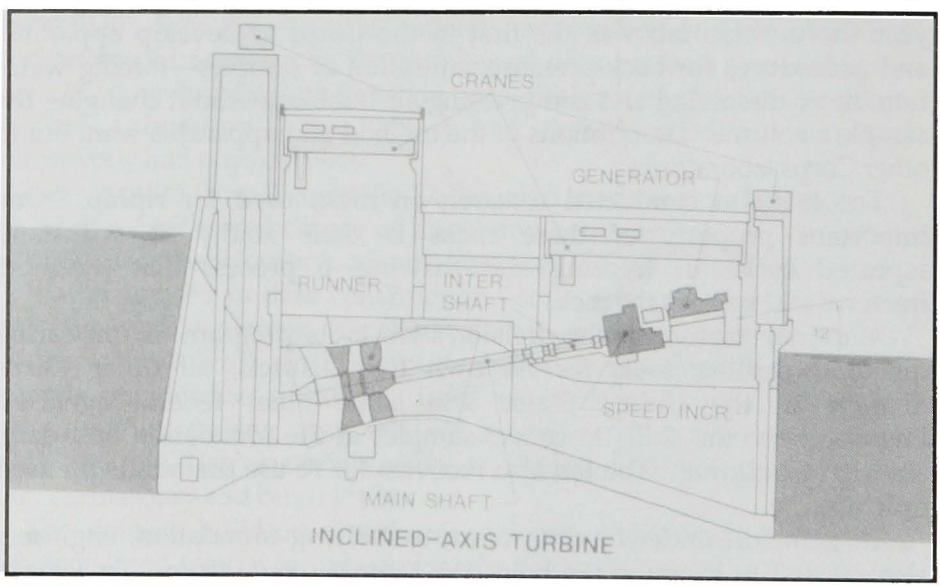
the lab bought a television version of the camera. Only 1.5 inches in diameter, this instrument furnishes a live view and videotape of the walls of a core boring up to 200 feet deep. Its superior resolution is particularly valuable in examining fractures, cavities, the inflow of water and the character of materials. Lab employees can use the videotape at conferences and design revisions to acquaint engineers and geologists with subsurface details.

Other examples of the exotic equipment at the lab include the atomic absorption spectrophotometer, the gas chromatograph, the total organic carbon analyzer and the specific ion analyzer. These devices are often referred to as examples of "black box chemistry." They were needed to meet the increasing demands for testing water and soil samples for various toxins and hazardous materials, often in concentrations as small as a few parts per billion.

The microcomputer revolution also hit the laboratory. Test data is now monitored, stored, computed and plotted electronically. Whole test reports now go to the districts via computer networks. All this equipment helped the lab meet the needs for both routine and exotic testing as manpower resources continued to shrink.

Hydroelectric Power Design Branch

The southwestern United States is not usually seen as having hydroelectric power plants. But within the division's five districts, the Army Corps of Engineers had built 17 such plants by 1971. Through



The division's Hydropower Design Branch determined that inclined-axis turbines were more economical than traditional designs.

its hydroelectric power design branch the division provided the technical expertise used in the plants' design and construction.

When the Denison District closed in 1945, the Southwestern Division created the branch as part of the Engineering Division. To minimize staff fluctuations because of variations in workload, the division staffed the branch with enough people to design only one or two plants at a time. When that was not enough, the division hired architect-engineer firms to help with design details.

When a district had a dam with a power plant in the works, it "hired" the branch to draft contracts with architect-engineer companies, prepare government estimates and negotiate final contracts. The district handled administrative responsibilities and delegated to the branch authority to manage the technical details. After the contract was awarded, the branch, on behalf of the district engineer, supervised the firm's activities. It also supplied expertise for procurement of power-plant components such as turbines, generators and switchgear. During construction the branch provided technical support for resolution of any problems.

Whitney Dam on the Brazos River was the first hydropower project the branch designed. A combined earthen and concrete structure, Whitney is 17,695 feet long. Two penstocks carry water to two vertical Francis turbines each having a 15,000-kilowatt capacity at maximum power pool level. Power production began in 1953.

The Hydroelectric Power Design Branch encountered its heaviest workload in the 1960s during construction of the McClellan-Kerr Waterway. Five of the system's dams incorporated hydropower units. Three of these were conventional vertical-axis units. But engineers chose an innovative axial-flow inclined-axis design for two plants, Ozark and Webbers Falls. The decision was based on economy, resulting from the reduced size of the power house. The branch then had to locate manufacturers who could design and fabricate components for a slant-axis unit of this size.

The smaller size of the power house led to another problem for the branch—a corresponding drop in the diameter of the generators. To achieve the same power output as in the earlier designs, the branch used a speed increaser to boost the turbine's revolutions per minute.

Because Congress had authorized no new hydropower plants, the Hydroelectric Power Design Branch went out of existence in December 1972.

Economics and Social Analysis Branch

In addition to the lab and Hydroelectric Power Design Branch, the Southwestern Division at one time provided another special service to

its districts and at times to other districts—the Economics and Social Analysis Branch of the Planning Division.

The Office, Chief of Engineers created planning divisions at its field divisions in 1965. The economics branch was created at the same time as an integral part of the new offices. At the time, the division had one professional economist. He became chief of the new branch, whose principal purpose was to give increased emphasis to planning in the pre- and post-authorization stages of the division's civil works studies. Because districts could not afford their own economic specialists, the division would make them available. Soon after its establishment, the economics branch employed a transportation-marketing specialist.

The branch had several functions. One of the most important was the review of all economic, or feasibility, studies made by the districts. It interpreted policy from headquarters as it related to economics and social studies, and it provided input to the headquarters in economics-related policy-making matters.

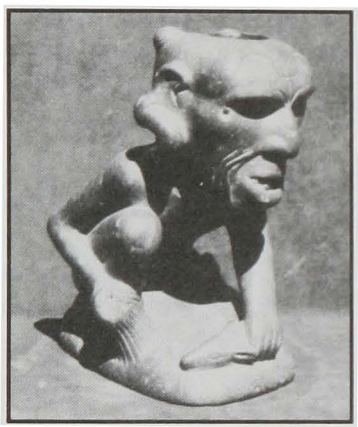
Beginning in 1968, the branch assumed the functions of the five districts in making area economic studies. The change would eliminate duplication of services. Many studies under way at the districts were immediately transferred to the division. The centralization was to establish a unified system for economic projections such as population, income and employment. It also allowed for increased standardization in presenting base studies and for a unified position in dealing with outside agencies. The chief of engineers commended the Southwestern Division for the centralization move and said he would consider the approach for other divisions.

In March 1969 the economics branch submitted a research proposal to the Chief of Engineers for a study of the effects of the newly opened McClellan Kerr-Arkansas River Navigation System. It would be the first time the Army Corps of Engineers had tried to make this type of analysis on one of its operating projects. The Corps' Institute for Water Resources played a part in planning the study and published its results.

When the Corps acted to reduce costs during the Reagan Administration, the branch began to trim its services. Social studies evaluation went back to the districts in 1982. Area economic studies were returned to the lower level in 1985. Water supply studies went to the districts the next year. Branch personnel dropped to a third of its mid-1970s peak. Because of the drop in civil works activity, the change caused no hardship on the remaining staff. The availability of computers increased the districts' capability to do the required work. On the eve of the division's 50th anniversary, therefore, the economics branch was returning to its traditional review position.

9
ARCHAEOLOGY

Since the mid-1960s the Army Corps of Engineers has developed a strong interest in archaeology, a development related to the rise in environmentalism and the general public interest in American ethnic culture. The Southwestern Division was the forerunner among the Corps' divisions in archaeological activity. Its interest originated during World War II in the Tulsa District. As time passed, the division broadened its archaeological capabilities.



Southwestern Division archaeology specialists try to preserve artifacts like this human effigy stone pipe from the Craig Mound at the Spiro archaeological site in Oklahoma.

Prior to the 1930s, federal involvement in archaeology was sporadic and disorganized. Through the public works programs of that decade, archaeology took a great step forward, largely through the Works Progress Administration. But the Corps' involvement in archaeology remained minimal and perfunctory. Economic development took precedence over environmental considerations in the Corps, as it did throughout the United States in both public and private sectors.

During World War II, however, this condition changed in the Tulsa District, partly by chance, partly by direction, and perhaps because of the wealth of archaeological sites in Oklahoma.

The district's first foray into the archaeological arena began with the Flood Control Act of 1944, which authorized the Corps to construct and operate public parks and recreational facilities on its properties. A Tulsa District employee suggested that the act could include archaeological sites along with parks and boating facilities. He contacted the Smithsonian Institution for advice, and by 1946 an archaeologist from the University of Oklahoma was conducting a survey of two Tulsa projects, Fort Gibson and Tenkiller Ferry. A year

later he found a significant site at Wister Reservoir. Since 1948 more than 60 archaeological sites have been found on the project's grounds.

"Crisis archaeology"

Archaeological activity in the Tulsa District remained limited, however. The Corps had to depend on the National Park Service for funding and completion of studies. During the 1950s archaeologists working with the Corps practiced "crisis archaeology." That is, they made a quick excavation at a site, salvaging what they could before it was flooded by a reservoir. That was the case with most excavations, federal and private, because of the limited funds and the available technology. Funding was especially poor for Tulsa District projects in the 1960s and early 1970s because most of the limited money Congress allocated to the Park Service for archaeology went to higher-priority projects in the Missouri River Valley.

First official archaeologist

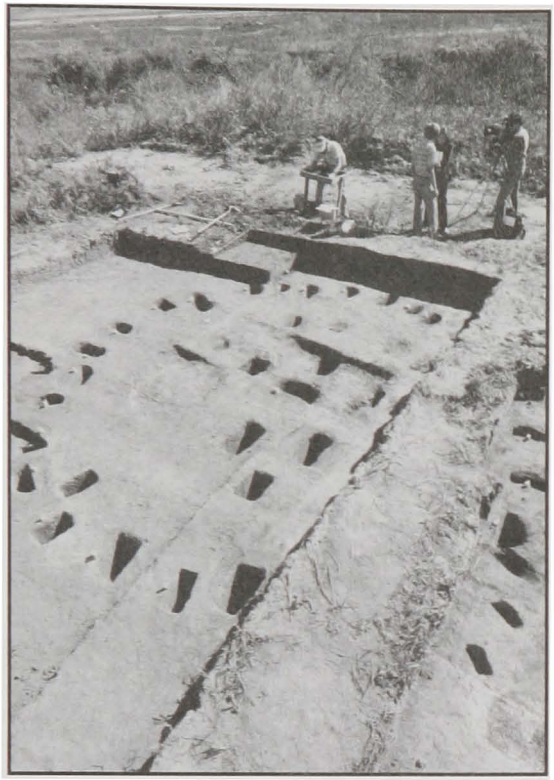
In 1974 Congress moved to allow federal agencies and departments to spend up to one percent of a project's total construction cost on archaeological work. At that point, the Corps of Engineers began placing archaeologists within its districts in the United States. Again the Tulsa District was a step ahead. In 1970 it had taken into its environmental resources branch a geologist who also met civil service requirements for archaeologist. After the position he held was reclassified, he became the first officially recognized full-time (and until 1974 the only) archaeologist in the Corps. He later took the position of division archaeologist, another Corps first.

By 1978, each of the division's five districts had at least one archaeological position and a combined program of more than $3 million annually—the same as the National Park Service's total 1973 archaeological budget.

Because of the division's expertise, the Corps headquarters and other divisions and districts frequently went to it for advice on archaeological matters. Southwestern Division personnel helped draft regulations to implement the new laws on archaeology.

To provide greater uniformity in application of policy and to provide the districts with a forum for discussing the issues, the division in 1976 began conducting annual archaeology workshops. Since 1980, the Chief of Engineers Office has sponsored similar meetings for Corps archaeologists.

One recent landmark in the division's archaeology program was its involvement in the Second New World Conference on Rescue Archaeology. The division sponsored the 1984 meeting in Dallas along



Southern Methodist University archaeologists discuss postholes from a 1,000-year-old house with a news reporter at Joe Pool Lake near Dallas in 1985.

with other federal agencies, the Organization of American States and Southern Methodist University. The international conference attracted 250 men and women—business people, international financiers, government administrators and archaeologists—from 19 countries who discussed the problems of studying sites that face damage or destruction from either natural or man-made causes.

In 1984 the Southwestern Division began a comprehensive archaeological overview of its entire jurisdiction that covers the division's physiography, drainage basins, culture areas, reviews of previous archaeological work and assessments of advanced technological developments for archaeological studies. The information was to be placed in a computerized data bank and updated when needed. The overview will provide a common point of reference for future archaeological studies and district and project management plans. If it meets expectations, the project will become a model for application throughout the Corps.

The Southwestern Division's leadership in archaeology is clearly recognizable. From the first steps in Tulsa District in the 1940s, cultural preservation has grown in importance in the division. Archaeology may well be the best example of why the division calls itself the Pacesetter.